**System Priority:  Integrated Electronic Data and Information Systems**
**Objective:  Wisconsin Information Network for Public Health Operations (WINPHO)**

**Long-term (2010) Subcommittee Outcome Objective:** By 2010, Wisconsin will have an integrated electronic information system that measures public health system capacity and provides meaningful information about Wisconsin's 5 infrastructure and 11 health priorities for individuals and organizations to improve the health of Wisconsin's population.

| Inputs | Outputs | | Outcomes | | |
|---|---|---|---|---|---|
| | **Activities** | **Participation/ Reach** | **Short-term 2002-2004** | **Medium-term 2005-2007** | **Long-term 2008-2010** |
| Office of Public Health Information Systems<br><br>Wisconsin Information Network for Public Health Operations<br><br>Wisconsin Information Network for Public Health Operations (WINPHO) Management Team<br><br>Turning Point Implementation Team<br><br>Project Management Team<br><br>Private Sector System Users<br><br>Public Sector System Users<br><br>General Public Users<br><br>Existing standardized | <u>Step 1:Project Initiation: Scoping</u><br>• Public Health Data Steering Committee will recommend the establishment of an Office of Public Health Information Systems and staff it appropriately (year 1, month 1).<br>• Establish an WINPHO management team whose global tasks include communicating the plan, educating partners on the plan, generating buy-in, using lessons learned from other state, county, local partners, and incorporating best practices (year 1, month 1).<br>• Commit adequate resources to nurture and drive the project forward and sustain (year 1, month 1).<br>• Establish a Project Management Team of computer advisors and consultants (year 1, month 1).<br>• Identify key stakeholders, inputers, and users of WINPHO (year 1, month 3)<br>• Identify, categorize, and include the user community (year 1, month 3).<br>• Define the 'universe' and requirements (year 1, month 8)<br>• Examine the data needs of Wisconsin's 5 infrastructure and 11 health priorities from implementation plans and identify overlapping needs of all Turning Point subcommittees (year 1, month10).<br>• Identify and categorize the major business process areas required for the system, including existing, quality data systems (year 2, month 3).<br>• Secure input from all affected parties to determine data desired (ongoing).<br>• Identify gaps, overlaps, and inconsistencies in data collection (ongoing).<br>• Develop a statement of scope definition: what's in and what's out (year 2, month 6) | Public Sector Users<br><br>Private Sector Users<br><br>General Public<br><br>Community HMO<br><br>Health Care Providers<br><br>State Bureaus<br><br>Local Health Departments, Tribes, Boards<br><br>Legislators | By 2003, Wisconsin will develop the WINPHO framework that standardizes the collection and tracking of data including: demographic and socioeconomic; Wisconsin's 5 infrastructure and 11 health priorities; uses existing, established technology and compatible information systems for tracking morbidity, mortality, and emerging threats such as the National Electronic Disease Surveillance System and Health Alert Network; and complies with state and federal regulations and security requirements. | | |

**System Priority:  Integrated Electronic Data and Information Systems**
**Objective:  Wisconsin Information Network for Public Health Operations (WINPHO)**

| Inputs | Outputs | | Outcomes | | |
|---|---|---|---|---|---|
| | **Activities** | **Participation/ Reach** | **Short-term 2002-2004** | **Medium-term 2005-2007** | **Long-term 2008-2010** |
| systems (Health Alert Network; National Electronic Disease Surveillance System).<br><br>Resources from private and public sector partners in terms of time, expertise, personnel, funding, equipment, technology, ongoing maintenance and interim trouble-shooting, statutes<br><br>Resources from non-governmental sources: RWJ and Bill and Melinda Gates Foundations<br><br>Office of Public Health Information Systems<br><br>Project Director<br><br>Program Manager<br><br>Technical Manager<br><br>Business Analyst<br><br>Data Base Analyst | <u>Step 1:Project Initiation: Scoping</u>  *(continued)*<br>• Provide report to WINPHO Management Team for approval (year 2, month 6)<br>• Identify targets of opportunity to decrease costs and increase benefits (year 2, month 6)<br>• Evaluate and build on current quality systems (National Electronic Disease Surveillance System and Health Alert Network) and infrastructure.<br>• Check back with Project Management Team (PMT) and Turning Point Implementation Team at least twice a year.<br>• Develop marketing and publicity plan (year 2 ongoing).<br><br><br><u>Step 2:   Project Analysis Phase</u><br>• Staffing of the Office of Public Health Information Systems (year 2) (See Organizational Chart, Appendix A).<br>• Promote public, private, and academic partnerships in the development and use of the WINPHO (ongoing).<br>• Establish a Public Health Information Systems Project Management Office for the analysis phase.<br>• Select a qualified project director, program manager, technical manager, and staff  (such as business and database analysts).<br>• Create data standards for the Public Health Information System (e.g.,  day, month, year).  Input sources for this step may include the consideration of existing standardized elements/systems such as the National Electronic Disease Surveillance System and Health Alert Network and Department of Health and Family Services common core, U.S. census data,  minimum data sets, Medicare/Medicaid, insurance standards  (Health Insurance Portability and Accountability Act), Vital Statistics (e.g., birth and death certificate data). (year 2, month 8).<br>• Create standard definitions and measures (year 2, month 8)<br>• Identify and define the major business (work) processes (i.e., public health  system-related activities) (year 2, month 10). | Individuals, Communities, and Organizations | | By 2007, increase the number of individuals and organizations that use information from WINPHO. | |

**System Priority:  Integrated Electronic Data and Information Systems**
**Objective:  Wisconsin Information Network for Public Health Operations (WINPHO)**

| Inputs | Outputs | | Outcomes | | |
|---|---|---|---|---|---|
| | **Activities** | **Participation/ Reach** | **Short-term 2002-2004** | **Medium-term 2005-2007** | **Long-term 2008-2010** |
| WINPHO Management Team<br><br>Public Health Data Steering Committee<br><br>Resources from private and public sector partners<br><br><br><br><br><br><br><br><br>Office of Public Health Information Systems Leader<br><br><br>Project Management Team Staff (e.g., Systems Analyst, Systems Designer)<br><br>Resources from private and public sector partners | Step 2:   Project Analysis Phase *(continued)*<br>• Drill down within each of the business areas to define detailed specifications of processes, data, and information required for all users to conduct their job (year 2, month 11).<br>• Incorporate recommended System Capabilities and System Characteristics (See Appendix C).<br>• Develop workshops with system user groups (year 2, month 11).<br>• Create deliverable and system requirements documents defining system deliverables and requirements.<br>• Determine data needs (year 2, month 12)<br>• Develop system architectural framework to define how all processes and data interact.<br>• Develop the technical bases for a request for proposal for subsystem development.<br>• Develop operational budgets (year 2, month 12).<br>• Identify targets of opportunity to decrease costs and increase benefits (ongoing)<br>• Evaluate and build on current, tested quality systems work (ongoing).<br><br>Step 3:   Project Design Phase<br>• Design system capabilities (year 2, month 12).<br>• Create design document for each component including data structure definitions, including performance and security requirements (year 2, month 12<br>• Provide a report to the WINPHO Management Team.<br>• Develop a detailed development plan, including costs, timelines,  functionality. and testing (year 3, month 1).<br>• Make decisions to build it, buy it, or pay vendors to build it (year 3, month 2).<br>• Develop a prototype if building the system (year 3, month 3).<br>• Establish/expand public and private workgroups for design validation (i.e., expand Public Health Data Steering Committee to include private sector) (year 4).<br>• Revise the detailed development plan (year 4).<br>• Check in with the Project Management Team and Turning Point Implementa-tion Team at least twice a year. | Local Health departments and Tribes<br><br>Division of Public Health<br><br>Local h Health Departments and Tribes<br><br>Division of Public Health Users | | | |

**System Priority:  Integrated Electronic Data and Information Systems**
**Objective:  Wisconsin Information Network for Public Health Operations (WINPHO)**

| Inputs | Outputs | | Outcomes | | |
|---|---|---|---|---|---|
| | **Activities** | **Participation/ Reach** | **Short-term 2002-2004** | **Medium-term 2005-2007** | **Long-term 2008-2010** |
| Programmers<br><br>WINPHO Management Team<br><br>Public Health Data Steering Committee<br><br>Help Desk Staff<br><br>Division of Public Health | Step 4:   Project Construction Phase: Test, Deploy, Support<br>• Build the system (year 5, month 6).<br>• Test the system often as functionality is added and refine the system after testing  (ongoing).<br>• Develop a training and outreach program and begin implementation (year 5,  month 8).<br>WINPHO Management Team will continue to implement the marketing and  publicity  plan (ongoing).<br>• Plan and conduct training needed by the public health system workforce and general public (ongoing).<br>• Implement the entire system--deployment (year 6).<br>• Technical infrastructure (year 6).<br>• Develop migration of old data to new systems (year 6).<br>• Provide for maintenance and enhancement support program (user), and help desk staff (in year 6).<br>• WINPHO management team will evaluate the system and user satisfaction (year 6, month 6).<br>• Build in check backs with Project Management Team and Turning Point Implementation Team at least twice each year.<br><br>Step 5:   Develop a Plan for Growth and Change<br>• Develop a written plan for growth and change (year 6, month 10).<br>• Maintain flexibility to accommodate changing needs (ongoing)<br>• Create a plan for integrating new technology (e.g., web based, wireless) (ongoing).<br>• Plan for ongoing support of WINPHO and appropriate office staffing (ongoing).  Plan for futuristic look as to what's possible (e.g., high definition, enterprise integration with video records, audio records, e-business), visioning, and  preparation.<br>• Plan for an ongoing cycle of equipment replacement and innovation updates. | | | | By 2010, Wisconsin will have an integrated electronic data and information system (WINPHO) that measures public health capacity and provides meaningful information on Wisconsin's 5 infrastructure and 11 health priorities for individuals and organizations to improve the health of Wisconsin's population. |

# System Priority: Integrated Electronic Data and Information Systems
## Objective: Wisconsin Information Network for Public Health Operations (WINPHO)

**Long-term (2010) Subcommittee Outcome Objective**

By 2010, Wisconsin will have an integrated electronic information system that measures public health system capacity and provides meaningful information about Wisconsin's 5 infrastructure and 11 health priorities for individuals and organizations to improve the health of Wisconsin's population.

| Wisconsin Baseline | Wisconsin Sources and Year |
|---|---|
| No baseline | Healthier People in Wisconsin 2000 |
| 100+ unrelated databases lacking standardized data elements and information | Department of Health and Family Services Wisconsin Health Care Database Survey Report August 16, 1999 |

| Federal/National Baseline | Federal/National Sources and Year |
|---|---|
| No baseline | Healthy People 2010 |

| Related USDHHS Healthy People 2010 Objectives | | | |
|---|---|---|---|
| **Chapter** | **Goal** | **Objective Number** | **Objective Statement** |
| 23 | Ensure that Federal, Tribal, State, and local health agencies have the infrastructure to provide essential public health services effectively. | 23-1 | (Developmental) Increase the proportion of Tribal, State, and local health agencies that provide Internet and e-mail access for at least 75 percent of their employees and that teach employees to use the Internet and other electronic information systems to apply data and information to public health practice. |
| 23 | Ensure that Federal, Tribal, State, and local health agencies have the infrastructure to provide essential public health services effectively. | 23-2 | (Developmental) Increase the proportion of Federal, Tribal, State, and local health agencies that have made information available to the public in the past year on Leading Health Indicators, Health Status Indicators, and Priority Data Needs. |

| Definitions | |
|---|---|
| **Term** | **Definition** |
| Public Health Data Steering Committee | Refers to the group of state, local, and public health system partners that serves in an advisory role to the Division of Public Health and the Wisconsin Turning Point Initiative Implementation Grant. |

**Rationale**:

An integrated public health information system is needed to effectively serve the data needs of local, state, tribal, and national public health workforce and Wisconsin's citizens. The proposed concept for such a system is the Wisconsin Information Network for Public Health Operations (WINPHO). On a daily basis, partners in the Wisconsin public health system - government public health professionals, health providers, tribal representatives, researchers, community advocates, faith community volunteers, insurers, business leaders, policymakers - feel limited in their ability to access relevant, population-based information. Though many data systems exist, the fact that these systems are not based on an established set of standards means that they operate independently, contributing to inefficiencies such as duplicative data entry, incomplete data on individuals, family or communities, and unreported information.

The State of Wisconsin needs to provide leadership on this initiative. Over the past two years, the Wisconsin Turning Point Initiative's Transformation Team collected data that identified an integrated electronic public health information system as crucial to transforming the public health system in Wisconsin. "Wisconsin must develop an integrated electronic, public health information system to provide statewide and community-level (county, municipality) population data needed for status assessment, policy development, assurance, service delivery, resources management and accountability." Thirteen recommendations from the Turning Point Transformation Team included: (1) measure health status and health capacity based on Wisconsin's 5 infrastructure and 11 health priorities; (2) provide leadership to link systems with Wisconsin's priorities; (3) conduct statewide assessment on information requirements; (4) identify minimum data set of standard, common core elements for collection and reporting; (5) assure state and local resources align with identified priorities for maximum input; (6) increase access to internet, e-mail, and other technology; (7) increase geographic coding and use; (8) use information to determine outcomes and fiscal accountability; (9) assure access to meaningful information, in a timely manner, to local communities; (10) work with public health system partners (private and public) to identify common formats; (11) develop/improve data systems for consistent and accurate reporting on race, ethnicity, and sex to increase understanding and eliminate disparities; (12) ensure confidentiality, and (13) conduct research specific to vulnerable populations with significant health disparities (*Turning Point Report*, 2000).

The U.S. Department of Health and Human Services (USDHHS) and Centers for Disease Control and Prevention (CDC) document, Public Health's Infrastructure (1999), raised concerns about the readiness of the national public health system to respond to public health threats of the 21st century. A robust information and data system was identified as the most important infrastructure component. The document provided a basis for beginning the building of an integrated data system that would include, "guidelines, recommendations, health alerts, standards-based information, communication systems that monitor disease, and enables efficient communication" among affected organizations (USDHHS and CDC, 1999, p. 6).

Based on the Public Health Infrastructure Report findings, the U.S. public health infrastructure is "insufficient to protect Americans from emerging threats." The American Public Health Association said that rebuilding of the public health infrastructure is one of the national priorities. They supported establishing partnerships to address the infrastructure issues of information and data systems, workforce capacity and competency, and organizational capacity at the state and local health departments and laboratories (*Nation's Health*, 2001).

The Frist-Kennedy Bill (now Kennedy-Frist), entitled "Public Health Threats and Emergencies Act of 2000," attempted to expand the capacities of public health agencies to detect and respond to significant public health threats.

The National Health Insurance Portability and Accountability Act of 1996 prescribes the development of electronic health information technologies to improve efficiency and provide for security and privacy of individually-identifiable health information. This act describes how individually identifiable health information may be shared and transmitted electronically and develops a basis for standardization of health-related data (Health and Human Services Federal Register, 2000; Gostin, 2001; Leean, 2001).

Selected informatics activities include integration, standardization, and information dissemination. Advantages and disadvantages to keep in mind include "accessing and using nontraditional and diverse sources of data for surveillance" from public health and other disciplines; "improving timeliness and quality of data while also reducing the burden of collecting data"; and "ensuring privacy and confidentiality" of client data (CDC, 2001, p. 16-17).

The Wisconsin Public Health Data Steering Committee is a statewide committee of local and state representatives addressing data needs (2001). The 2000 report of the Wisconsin Public Health Data Steering Committee forwarded 7 recommendations regarding WINPHO and included: (1) hiring a Program and Planning Analyst Advanced Management Public Health Data Coordinator; (2) appointing a project management and team leader to facilitate data needs; (3) integrating existing systems into a larger system plus financial support; (4) using the Health Alert Network as the infrastructure vehicle; (5) identifying information technology public and private resources; (6) informing policy makers and potential funders and identifying opportunities for system development such as CDC; and (7) creating a marketing plan to inform public health leaders and key partners about the importance of WINPHO and the need for financial commitment. In 1999, Wisconsin was one of several states that received funding from CDC to participate in the Health Alert Network initiative. The Health Alert Network supports the public health response basic infrastructure through creating a network, providing training, and monitoring organizational capacity (Kuehn, 2000; Marshall, 2000; Hanrahan, 2001).

In 2000, Wisconsin received CDC funding to support the National Electronic Disease Surveillance System (NEDSS) to address the public health response essential capabilities through common data collected creating a secure web-base. The National Electronic Disease Surveillance System assures essential public health capabilities by: (1) using a common data model; (2) creating a secure, web-based method for integrating all public health surveillance and information systems; (3) creating an integrated data repository; (4) using the University of Wisconsin Department of Information Technology to assess, plan, and implement a National Electronic Disease Surveillance System, and (5) assuring that all CDC surveillance systems are National Electronic Disease Surveillance System compliant (Hanrahan, 2001; Proctor and Hanrahan, 2001).

With regard to data collection and tracking of Wisconsin's *health* priorities, Harris, Holman, and Caranda-Kulis (2001) state that "we know enough today to invest wisely in prevention and health promotion and to expect reasonable returns on our investment . . . the benefits and cost effectiveness of preventive services, such as tobacco control, vaccination, and mammography, ranges from $10,000 to $100,000 per quality-adjusted life year." (p. 378)

WINPHO will serve to integrate relevant health and disease information along with laboratory results and surveillance data from the many members of the health care community and the public health system. In the past, information was known by a select few. Looking to the future, integrated systems allow communication of multiple information systems to extract and transform information, making it possible to download it to other locations. Proper infrastructure is needed to make access to appropriate information on behalf of the public's health a reality. The outcome will be enhanced health outcomes and improved public health capacity.

## Outcomes:
### Short-term Outcome Objective (2002-2004)
By 2003, Wisconsin will develop the WINPHO framework that: (1) standardizes the collection and tracking of data, including demographic and socioeconomic data, for the 11 health and 5 infrastructure priorities; (2) uses existing, established technology and compatible information systems for tracking morbidity, mortality, and emerging threats such as the National Electronic Disease Surveillance System and Health Alert Network; and (3) complies with state and federal regulations and security requirements.

The process of WINPHO development and linkages would consist of phases that are comprised of: (1) project initiation; (2) project analysis; (3) project design; (4) project construction; and (5) planning for growth and change. The Integrated Electronic Data and Information Systems Subcommittee recommends establishing an Office of Public Health Information Systems. A WINPHO Management Team will be established and given the authority to act on decisions. The WINPHO Management Team will provide leadership in communicating the plan and its rationale, and educating others about the benefits and implications of WINPHO. The team will help to generate buy-in from multiple end users who include the public sector (e.g., state departments, local health departments and boards, city and county officials, schools), private sector, voluntary organizations, health care agencies, private foundations, legislators, and the general public of community users. A Project Management Team, consisting of systems designer experts, programmers, and public health data experts is needed to design and implement the system. Staffing of the Office of Public Health Information Systems with qualified, knowledgeable individuals is critical to the success of this infrastructure development.

**Inputs:** *(What we invest – staff, volunteers, time money, technology, equipment, etc.)*
- Office of Public Health Information Systems
- WINPHO Management Team
- Project Management Team
- Private Sector Users
- Public Sector Users
- General Public Users
- Existing Standardized Systems (e.g., Health Alert Network, National Electronic Disease Surveillance System (NEDSS))
- Resources from private and public sector partners in terms of time, expertise, personnel, funding, equipment, technology, on-going maintenance, and interim troubleshooting
- Resources from private foundations (e.g., Robert Wood Johnson Foundation, Bill and Melinda Gates Foundation)

**Outputs:** *(What we do - workshops, meetings, product development, training. Who we reach - community residents, agencies, organizations, elected officials, policy leaders, etc.)*

Step 1 – Project Initiation: Scoping

The *project initiation* phase involves aspects of: (1) establishing an Office of Public Health Information Systems and WINPHO management team; (2) identifying what data exists, where it exists, what gaps exist, what data is needed, what standard architecture to use, and how to access and utilize existing data; (3) defining quality databases; (4) utilizing confidentiality and security systems and options that meet with federal and state regulations as well as local needs; (5) identifying funding opportunities, costs, and benefits; (6) writing the scope definition; and (7) developing a marketing and publicity plan.

- In year 1, month 1, the Division of Public Health will establish an Office of Public Health Information Systems.
- In year 1, month 1, the Public Health Data Steering Committee will advise on the establishment of a WINPHO Management Team whose global tasks include: communicating the plan; educating partners about the plan; generating buy-in; using lessons learned from other state, county and local partners; and incorporating best practices.
- In year 1, month 1, the Public Health Data Steering Committee will recommend that the Division of Public Health commit adequate resources to nurture and drive the project forward and sustain the project long term.
- In year 1, month 1, the Public Health Data Steering Committee will advise on the establishment of a Project Management Team of computer advisors and consultants, including a Program and Planning Analyst.
- In year 1, month 3, the WINPHO Management Team and the Project Management Team will identify key stakeholders, data sources, and users of WINPHO.
- In year 1, month 5, the WINPHO Management Team and the Project Management Team will identify, categorize, and include the user community in planning and implementation.
- In year 1, month 8, the Project Management Team will define the universe and requirements, and provide the report to the WINPHO Management Team.
- In year 1, month 10, the Project Management Team will examine the data needs of the 5 infrastructure and 11 health priorities and the crosswalks identified in the implementation planning process.
- In year 2, month 3, the Project Management Team will identify and categorize the major business process areas required for the system, including existing quality data systems.
- Throughout the process, teams will secure input from all affected parties to determine data desired.
- Throughout the process, teams will identify gaps, overlaps, and inconsistencies in data collection.
- In year 2, month 6, the Project Management Team will develop a statement of scope definition (what's in and what's out). The report is to be provided to the WINPHO Management Team for approval.
- In year 2, month 6, the Project Management Team will identify targets of opportunity to decrease costs and increase benefits.
- In year 2, month 6, the Project Management Team will evaluate and build on current quality systems work such as the National Electronic Disease Surveillance System and the Health Alert Network.
- At least twice a year, the Project Management Team will check back with the Public Health Data Steering Committee.

- In year 2, the WINPHO Management Team will develop a marketing and publicity plan for the length of the project to encourage others to align their systems with selected systems standards, to use the system and to value the system. Link to other Turning Point marketing and publicity plans.

Step 2 – Project Analysis

The *project analysis* phase promotes partnership development and involves establishing an official *project management office* for the analysis and identifying a project director whose qualifications, education, and experience include such aspects as computer informatics, data analysis expertise, and systems architecture expertise. A program manager, technical manager, and staff that includes business analysts and database analysts are critical team members in this phase. (Refer to the organizational chart located in Appendix A). The analysis phase also involves the creation of a WINPHO *data standards framework* with consideration given to existing standardized systems such as the Health Alert Network and the National Electronic Disease Surveillance System.

The next step of the project analysis phase is that of identifying the data needed by the major business processes and the data and information required for health-related activities. The data relationships of the business processes is key to planning, efficiency, and cost savings. Advantages to establishing WINPHO and an example of its use are outlined in Appendix B. The subcommittee's recommended system characteristics, system capabilities, and issues for consideration are located in Appendix C. Once data is identified, a system architecture and framework would be designed to define how such processes and data relate to each other as well as to other business processes outside WINPHO. The creation of standard definitions and measures is necessary to provide reliability and validity to data collection and analysis, a critical step in the formation of meaningful public health system information (Kreuser, 2001). An operational budget would be developed and targets of funding opportunities identified.

- In year 2, create an Office of Public Health Information Systems project management.
- In year 2, the Division of Public Health will staff the Office of Public Health Information Systems.
- Select a qualified project director, program manager, technical manager, and staff including business analysts and database analysts.
- Promote public, private, academic partnerships in WINPHO development.
- In year 2, month 8, create data standards for WINPHO.
- In year 2, month 8, create standard definitions and measures for data elements.
- In year 2, month 10, identify and define the major business processes related to public health system related activities (this is considered to be a critical step).
- In year 2, month 11, drill down into each business area to define detailed specification of processes, data, and information required for all users to conduct their job.
- In year 2, month 11, incorporate recommended system capabilities and characteristics (See Appendix C).
- In year 2, month 11, develop workshops with system user groups.
- In year 2, month 12, create a deliverable and system requirements document defining system deliverables and requirements.
- In year 2, month 12, determine data needs.

- In year 2, month 12, develop the WINPHO system architectural framework to define how all processes and data interact.
- In year 2, month 12, develop the technical bases for a request for proposal for subsystem development.
- In year 2, month 12, develop operational budgets.
- Identify targets of funding opportunities to decrease costs and increase benefits (ongoing)
- Evaluate and build on current, tested, quality systems work (ongoing).

**Medium-term Outcome Objective (2005-2007)**
By 2007, there will be an increase in the number of individuals and organizations that use information from WINPHO.

**Inputs:** *(What we invest – staff, volunteers, time money, technology, equipment, etc.)*
- Office of Public Health Information Systems
- Project Director
- Program Manager
- Technical Manager
- WINPHO Management Team
- Public Health Data Steering Committee
- Resources from private and public sector in terms of time, expertise, personnel, funding, equipment, technology, on-going maintenance, and interim troubleshooting

**Outputs:** *(What we do - workshops, meetings, product development, training. Who we reach - community residents, agencies, organizations, elected officials, policy leaders, etc.)*

Step 3, Project Design Phase
The project design phase involves specifying what each component of the system software will do with the data structure definitions. This is followed by a financial analysis of construction alternatives, ending in a decision to build in-house, buy off-the-shelf, or bid-out. If the decision is to build the system, a prototype of major functionality would be created to test the design plan and integration issues. The project management team will be comprised of a systems analyst and a systems designer. A detailed development plan will be generated and revised. Subcommittee recommendations for security and confidentiality considerations are detailed in Appendix D.

- By year 2, month 12, the Project Management Team will design system capabilities.
- By year 2, month 12, the Project Management Team will create high-level design development plan document for each component. For each component, specify what the software needs to do with a specifically defined data structure, including performance and security requirements. Provide report to the WINPHO Management Team.
- By year 3, month 1, Project Management Team will develop a detailed development plan (e.g., cost, who does what by when, what functionality is built first, testing).
- By year 3, month 2, make decisions to build in-house, buy commercial off-the-shelf software, or pay vendors to build it. If building a system in-house, develop a prototype.
- By year 4, establish or expand public and private workgroups for design validation.
- By year 4, revise the detailed development plan.

- By year 5 and ongoing, at least twice a year, the Project Management Team will check back with the Public Health Data Steering Committee.

**Long-term Outcome Objective (2008-2010)**

By 2010, Wisconsin will have an integrated electronic information system, WINPHO, that measures public health system capacity and provides meaningful information on Wisconsin's 5 infrastructure and 11 health priorities for individuals and organizations to improve the health of Wisconsin's population.

**Inputs:** *(What we invest - staff, volunteers, time, money, technology, equipment, etc.)*
- Office of Public Health Information Systems
- Project Director
- Program Manager
- Technical Manager
- WINPHO Management Team
- Public Health Data Steering Committee
- Resources from private and public sector in terms of time, expertise, personnel, funding, equipment technology, on-going maintenance and interim troubleshooting

**Outputs:** *(What we do - workshops, meetings, product development, training. Who we reach - community residents, agencies, organizations, elected officials, policy leaders, etc.)*

Step 4, Project Construction: Test, Deploy, and Support

The *project construction* phase involves building, testing, and refining the system. The committee recommends a pilot testing of selected health priorities initially. Once the system is ready, implementation will include outreach to users, marketing to users and nonusers, and publicity of the power of the information from, and future implications of WINPHO. Reliable data from existing systems will be migrated into the new system during this phase. A critical component to the success of WINPHO is the system maintenance and project support for the users. An evaluation of the system, and user satisfaction, will guide future revisions.
- By year 5, month 6, the Project Management Team will build the system.
- Frequently test system as functionality is added (ongoing).
- Refine system after testing (ongoing).
- By year 5, month 8, develop a training and outreach program and begin implementation.
- WINPHO Management Team will continue to implement the marketing and publicity plan (ongoing).
- The WINPHO Management Team will have planned and started the training needed by the public health system workforce and general public on use of the system for data entry, retrieval, and report generation (ongoing).
- By year 6, implement the entire system.
- By year 6, technical infrastructure.
- By year 6, develop migration of old data to new system.
- By year 6, the Division of Public Health will provide for ongoing maintenance, and technical and enhancement support, including adequate help desk staffing.
- By year 6, month 6, the WINPHO Management Team will evaluate the system and user satisfaction.

- Ongoing scheduled check-backs with Project Management Team and Public Health Data Steering Committee.

Step 5: Develop a Plan for Growth and Change

The *growth and change plan* phase focuses on the long-term planning and support of WINPHO into the future. This phase consists of ongoing evaluation, user satisfaction, flexibility, futuristic planning, scheduled equipment replacement and updates, and the incorporation of technology enhancements.

- By year 6, month 10, develop a written plan for growth and change.
- Maintain flexibility to accommodate changing needs (ongoing).
- Create a plan for integrating new technology e.g., web-based, wireless) (ongoing).
- Plan for ongoing support of WINPHO and appropriate office staffing.
- Plan for futuristic look as to what's possible (e.g., high definition, enterprise integration, video records, audio records, e-business) through visioning and advance preparation.
- Plan for an ongoing cycle of equipment replacement and innovation updates.

## Evaluation and Measurement

The Integrated Electronic Data Information System Subcommittee recommends that the Project Management Team consider using: (1) an external assessment team to determine if the planned efforts have contributed to systems transformation; and (2) the experienced evaluators in Illinois, Missouri, Michigan, New Mexico, and New York State as examples of best practices. The Integrated Electronic Data Information System Subcommittee also recommends checking progress against the action steps in the attached logic model.

The Integrated Electronic Data Information System Subcommittee recommends the following measurements be conducted:

*Measurement*: Does the system capacity allow tracking of the 5 infrastructure and 11 health priorities? Does the system allow for the tracking of progress on one of the 3 overarching goals, eliminating health disparities?
*Evaluation:* Determine functionality successes and failures.

*Measurement:* Has the time and cost to obtain timely, relevant data decreased?
*Evaluation:* Use survey of users to determine if the data is easy to access and manipulate. Use survey to determine if funding streams have changed in support of WINPHO (e.g., have technology resources been applied to building linkages to WINPHO or have public health system partners continued to build separate, non-integrated systems). Compare prior costs of conducting business practices with costs after the WINPHO is developed.

*Measurement:* Is the public health system using data derived by WINPHO to guide their programs and policy decisions?
*Evaluation:* Use a survey to determine how data is being used and by whom (including private versus public sector partners). Number of hits per month will be graphed and user access tracked. Track the number of different data systems added to the system annually. Use survey to determine the number of local communities who use WINPHO for community assessments, if the number of hours to complete the assessment decreased, and if the data provided by WINPHO improved progress toward

intervention and outcome. Use survey to determine if program-based databases have become more efficient by being part of WINPHO, such as the Wisconsin Immunization Registry.

*Measurement:* Is the system adequately tracking the 5 infrastructure and 11 health priorities? Is a better tracking system leading to improvements in health outcomes?
*Evaluation:* Use a survey to determine how data is being used and if improvements in the 11 health priorities are occurring.

## Crosswalk to Other Health and System Priorities in Healthiest Wisconsin 2010

The Integrated Electronic Data Information System Subcommittee received 24 requests from the 15 other health and infrastructure priority subcommittees. The requests centered on the need for more meaningful, reliable and valid information to create baseline data, support decision making, and assist in progress tracking and evaluation of outcomes (Appendix E).

Based on feedback related to the computerized crosswalk exercise among the 16 *Healthiest Wisconsin 2010* subcommittees, identify overlapping areas and needs. The Integrated Electronic Data Information System Subcommittee noted a need to clarify the following important points:

- Since it will take several years to plan, build, test, and implement WINPHO, the other 15 *Healthiest Wisconsin 2010* subcommittees addressing infrastructure and health priorities will need to rely initially on existing information systems to gather baseline data and track progress.
- The other infrastructure and health priority subcommittees should not rely on the Integrated Electronic Data Information Systems Subcommittee to define what data should be collected (e.g., how to measure socioeconomic factors. Consideration should be given to this need as each team creates individual implementation plans. In this way, appropriate experts can provide guidance on these important issues with input from established workgroups of public and private users.
- Standardization of data collection, such as who collects what data and in what format, will need to be determined early in the project. Use of the WINPHO will depend on the system flexibility and robustness. The WINPHO Management Team will want to include input from the public health system community as part of the assessment.

## Significant Linkages to Wisconsin's 12 Essential Public Health Services

WINPHO, an integrated electronic public health information system, will cut across all essential services that are linked to the core functions of assessment, policy development, and assurance. A reliable, dependable, electronic data system will provide meaningful information at the local and state level on which to base accurate decisions for action, intervention, and evaluation of progress and fiscal impact. The information generated will assist the state in setting and directing public health policy, assuring access to care, evaluating progress toward state health and infrastructure priorities, and measuring public health capacity. WINPHO will provide the capacity to monitor health status, share information, educate the workforce, and inform citizens with timely and accurate information to improve the health of Wisconsin's population.

## Connection to the Three Overarching Goals of Healthiest Wisconsin 2010

The overarching goals of *eliminating health disparities*, *promoting and protecting health for all*, and *transforming Wisconsin's public health system* are underpinned by WINPHO.

The goal of eliminating health disparities requires the capacities needed from WINPHO to support the elimination of health disparities that assure: (1) consistency in the collection of race and ethnicity data across all public health programs and activities; (2) improvement upon the existing surveillance system for collecting race/ethnicity information and improve on the current Behavioral Risk Factor Study for policy and programmatic efforts; (3) collection of race/ethnicity data in all assessments of utilization of health services; and (4) inclusion in all future state reports on mortality, morbidity, and health behavior as to how such health data indicators vary among combinations of social and economic characteristics (race, ethnicity, income, education and occupation).

Promoting and protecting the health for all can be accomplished through the collection of specific data that are currently missing or partially collected in non-standardized formats. Through the use of WINPHO, Wisconsin will have current, reliable data that cuts across not only disease, illness, injury, disability, birth, and death, but would include sociodemographic and health status data. In this way, Wisconsin can track the prevention efforts on the front end that make a difference in disease, death, and disability, while not losing sight of the special populations for whom the burden is greatest. The outcome will be improved health of the population of Wisconsin and improved public health system capacity—resulting in transforming Wisconsin's public health system.

**Key Interventions and/or Strategies Planned**
Key interventions planned for the WINPHO development and continuation include: (1) educating participants and stake holders; training and supporting WINPHO users; securing long-term funding through the legislature; and changing the way government and others carry out business practices to create a more efficient productive public health system that can demonstrate; (2) adequate capacity to respond to threats and emergencies, 2) the outcome of risk reduction and preventive strategies; and (3) the impact on disease, death, and disability due to a focus on prevention. Although most people believe, and research suggests, prevention makes a difference and a is cost-saving, the cost savings associated with the establishment of an integrated system may present a public health system challenge.

The key components of the implementation strategy are directed toward: (1) establishing an office of public health information systems; (2) hiring qualified and appropriate managers and staff to initiate, analyze, design, and construct the system; (3) securing commitment and adequate funding to realize the long-term objective of having WINPHO in place by the year 2010; and (4) sustaining and improving WINPHO in the years ahead.

In an effort to realize the WINPHO goal, education is needed using multiple methods across multiple settings and public health system disciplines and the general public users. There is a need to educate all of Wisconsin public health system partners as to the need for the WINPHO and the power and potential use of information generated from the system. Within the State of Wisconsin governmental agencies including bureaus, divisions, and particularly the Department of Administration, there is a great need to teach and promote understanding on the need for reliable, meaningful, and timely information. Although there exist multiple systems across the state, most do not interact with other systems, but instead have been built as silos to collect data and answer limited questions of programmatic information (*Wisconsin Data Base Survey Report*, 1999). Many such systems contain information that is not known by public health professionals but may be of value if this information is shared and added to a larger integrated system.

The Department of Administration needs to understand informatics as it applies to the public health system. Not only must relevant data be collected in an integrated fashion, but the data must be evaluated using research methodologies that supports the value of public health interventions, determines fiscal impact on the burden of disease and disability, particularly on special populations, and assists in creating a more efficient work force through organized, standardized business processes.

The Legislature plays an important role in the success of WINPHO. As professionals and citizens generate interest in the WINPHO concept, momentum in Wisconsin will continue to build and influence the need for sustained financial support for public health system infrastructure. The state as a whole must commit to improved informatics on behalf of Wisconsin's population. Information generated from the early phases of WINPHO development, and work done to date on the Health Alert Network and National Electronic Disease Surveillance System, can be a powerful demonstration of the power of an excellent integrated information system.

Incentives from the WINPHO development and use will be: (1) the ease of access to appropriate and relevant information to users; (2) decreased hours and frustration in trying to obtain current data (as opposed to receiving 1999 statistical reports in 2001); (3) a more informed public health system, citizens, and legislators; and (4) reliable fiscal impact data related to health and disease.

**Best Practice Models**
Several states developed integrated information systems that are considered best practices and include New York State, New Mexico (Gerlach and Bailey, 2000), Missouri (Missouri Spatial Data Information Service), Washington, Alaska, and Ohio. For example, since 1995, Washington, Alaska, and Ohio use the internet-based Health Education Resource Exchange use the internet to assist health care professionals and local health departments with comprehensive information through creating a central clearinghouse of resources, research results, community projects, and materials (CDC, 2001, p. 11-14).

The CDC made great strides during the past 5 years in increasing access to information using the internet. The Youth Risk Behavior Survey data is posted on the web for increased sharing and ability to query the data by end users. The geographic information system is incorporated into the web-based systems including disease and death rates by gender, region, county, race, and ethnicity. Other systems available to selected users include: (1) Water Fluoridation Reporting System for monitoring 56,000 community systems across the U.S.; (2) Diabetes Management Information System for data collection and evaluation through surveillance activities; (3) National Oral Health Surveillance System which links to several data sources; (4) Health-Related Quality of Life database that focuses on measurement and the importance of quality of life to community health and productivity; (5) Healthy Days Survey Questions and Index that explores the impact of physical and mental health on days of limited activity associated with these issues; and (6) Smoking and Health Database to share 63,000 abstracts on articles and other materials (CDC, 2001, p. 1-9).

Wisconsin has several initiatives in process, one of which is the Wisconsin State Automated Child Care Welfare Information System. This is an example of an integrated electronic information system that will incorporate data from multiple databases. Recent advancements in the State of Wisconsin's e-government site include an Internet Portal that becomes the pathway to support web development and usage. Through this portal, public health information access could be made accessible to private users, government, businesses, and the public.

Wisconsin made considerable progress in the implementation of its Health Alert Network and National Electronic Disease Surveillance System program as evidenced by accomplishments that included: (1) successfully staffing National Electronic Disease Surveillance System activity through a subcontract with the University of Wisconsin-Madison, Division of Information Technology; (2) integrating the management and implementation of National Electronic Disease Surveillance System activity with Wisconsin's ongoing Health Alert Network program; (3) conducting stakeholders meetings with Wisconsin's public health senior management and surveillance data managers at the state and local level to provide National Electronic Disease Surveillance System background, secure buy-in, and obtain critical information on surveillance assets; (4) attending National Electronic Disease Surveillance System meetings and forums; (5) cataloging over 50 public health surveillance and information systems for inclusion in the Integrated Data Repository (IDR); (6) installing Oracle on a Windows 2000 Server for testing and development; (7) assessing J2EE compliant Web Servers and scheduled training in the Silverstream Web Server product; (8) evaluating the CDC based system offering, and plan to use it as the cornerstone of National Electronic Disease Surveillance System implementation; and (9) beginning extensive data modeling of existing communicable disease and laboratory reporting databases.

The CDC's National Electronic Disease Surveillance System helps several states to develop surveillance systems that link and communicate with CDC systems by using standard protocols, languages, and tools. The data will be accessible for a number of topics (CDC, 2001, p. 3-4). The 2001 Wisconsin National Electronic Disease Surveillance System operational plan focuses on completing the logic data models for communicable disease and laboratory reporting, writing program application modules and user interfaces, and installing and testing the National Electronic Disease Surveillance System compliant communicable disease/laboratory reporting surveillance system. Through supplemental funding, in year 2, National Electronic Disease Surveillance System will begin populating the IDR with the birth certificate database (early newborn hearing screening program), the local public health consolidated contracting data system, and the environmental health sanitation surveillance system.

**Conclusion**
The potential to have an integrated information system such as the WINPHO is great. With thoughtful consideration, broad and creative marketing and education to all users, buy-in from the Legislature, and securing sustained funding from multiple sources for staff, equipment, and technological advances, WINPHO will be a reality. Public health must take the lead on creating, building, and sustaining the infrastructure that "consists of the resources and relationships necessary to carry out the core functions and essential services of public health" (Turnock, 2001, p. 208). Capacity will require multiple resources including "human, informational, financial, and organizational" (e.g., statutes, leadership, partnerships) to put into place a solid foundation for Wisconsin's public health system (Turnock, 2001). Access to reliable, valid, timely, and meaningful health, disease, and capacity information is a critical beginning step to a successful public health system.

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**System Priority:  Integrated Electronic Data and Information Systems**
**Objective:  Wisconsin Information Network for Public Health Operations**
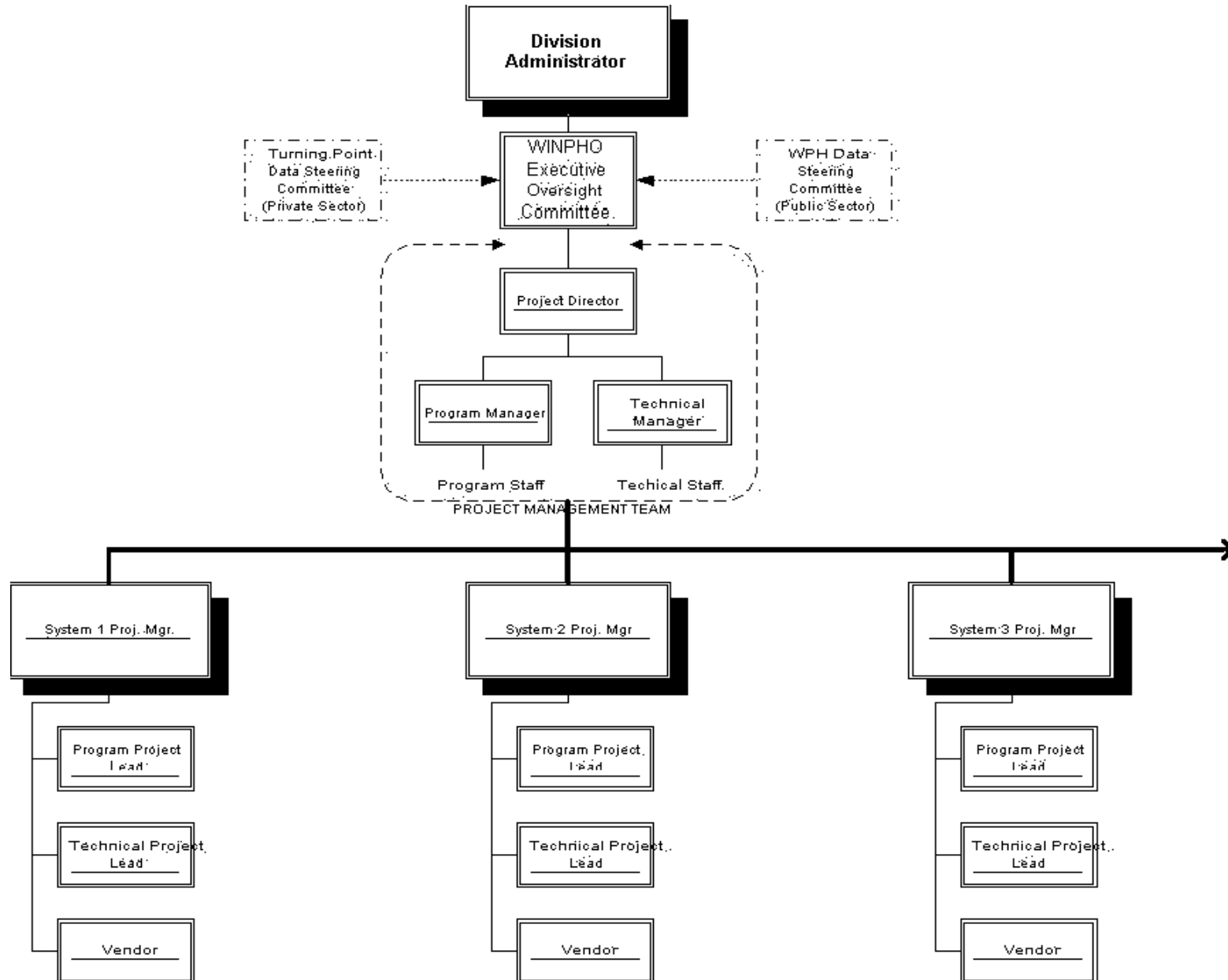
A public sector commitment to invest in manpower and financial resources for WINPHO will have a multiplier effect in terms of the quality and availability of the information needed to impact population-level public health and individual health care services. It can be the catalyst to meld private and public resources to provide a synergism of effort. Health care networks would have an increased awareness of local community needs and identified risks. Health care providers would have access to a broader range of information about clients, subject to established rules of client confidentiality and system security. Private industry would have access to population-level data to help develop resource allocation plans. Local public health departments could access more comprehensive client information to avoid duplication of services and determine gaps in necessary services by having timely public health information at a municipal level instead of zip code or county level. Schools could access more comprehensive student information. The public sector and policymakers at all levels would have access to information aggregated to their particular level of responsibility.

WINPHO benefits citizens by making information more readily available to them and in an easily understood format. Data including health and disease, risk factor reduction impact on disease and health, emerging health threats, and environmental and/or occupational health hazards will be available so citizens can make informed decisions about family and community health. Prevention activities will lead to an overall improved quality of life throughout the life cycle, reduced health care and insurance costs, and reduced burden of death and disability, particularly for special populations.

An Example of the Benefits of WINPHO

In the spring of 2001 a Dane County resident, Chuck, went fishing in the North Woods of Wisconsin. On his return home he found a tick on his leg and was concerned that he might contract Lyme Disease. He contacted his health provider and asked for assistance. The nurse asked which county Chuck had visited, what the tick looked like, what symptoms he was experiencing, and other pertinent questions. The nurse was able to access a database containing Chuck's medical records as well as a second database containing information on Lyme Disease in Wisconsin. In doing so, she was able to educate Chuck regarding incidence rates of Lyme Disease in the North Woods county, action to take, and future prevention strategies. The ability of Chuck's nurse to access multiple databases provided him with immediate, current, and relevant information about his situation.

The capacity of health care agency personnel to access information in a client database, as well as information about Lyme Disease incidence rates, and algorhythms for treatment and prevention, is critical to appropriate decision making and action. When an integrated electronic public health information system exists and all partners in the public health system participate, greater benefits accrue to the client, the organization, and the public health system as a whole.

<u>Appendix C</u>. Recommended WINPHO Capabilities and Characteristics and Issues to Be Considered

The Integrated Electronic Data and Information Systems Subcommittee recommends *system characteristics* that include:
- Expands the range of data available for more accurate decision making. For example, the integration of data from a variety of settings, such as health maintenance organizations and emergency rooms, hospitals, home care, and health departments in order to provide a better profile of health, injury, and illness.
- Provides statistical analysis, GIS mapping, and surveillance analysis.
- Identifies the fit of alternative practice.
- Provides a system language and aggregate analysis that is easily used by end users.
- Assures that business practices of governmental and non-governmental users can be supported.
- Develops a process that builds trust among partners and promotes information sharing
- Provides for implementation and maintenance of training and project assistance for end users. This may include assistance in interpreting data, quality checks on reports prior to their public release, and referrals to appropriate health or data experts as may be needed.
- Prevents double counting of multiple encounters/visits by a single client for accurate analysis.
- Supports diagnosis-related information as well as health indicator information across populations, including special populations.
- Supports individual, family or group, as well as population-based information.
- Assures local data are collected on the entire community, not just the users of the local health agency.
- Assures local data are collected at the municipal level for community-specific assessment and planning, especially in Milwaukee County.
- Tracks the Wisconsin health and infrastructure priorities.
- Handles the diversity, specific-focused programs such as the Women, Infants, Children (WIC) Program or the Lead Poisoning Prevention Program, while accommodating Medicaid and Medicare system data, hospitalization data, ambulatory care data, geographic indicators, race and ethnicity data, Behavioral Risk Factor Survey data, geocoding, and insurance data.
- Adds value, saves money, decreases health costs, reduces death and disability from diseases.
- Makes accurate, meaningful information available to a variety of end users, including local health departments, private agency users, and the general public.

The Integrated Electronic Data and Information Systems Subcommittee recommends *system capacity needs* that include:
- Data that captures business (work) processes, individual services, public health surveillance, and significant population-based public health impact.
- Workforce data, tracked by categories of work settings and health care shortage areas.
- Surveillance data may incorporate disease reporting, vital records, geocoding, results from other agencies such as the Department of Natural Resources, and the Environmental Protection Agency, and the Department of Transportation, laboratory test results, local environmental health data, hospitalization discharge data, pharmacological effectiveness, and controlled access to client data.
- Prevention information may include linkages to systems such as the Wisconsin Immunization Registry, health status, and health behavior information.
- Public health impact data will include accomplishment of state public health priorities, core functions, essential services, best practices, community assessments, and public opinion surveys.

- Individual data may include case management of lead-poisoned children, frail elders, new parents, and clients being treated for mental disorders.
- Access to information is controlled through security systems (Appendix D).
- Data elements may include individual, family, groups and populations, geographic sites, encounters, symptoms, outcomes, activities, processes, diagnosis, and treatment and prevention activities.
- Municipal level data is created for informed communities, since zip code and county level data are not specific to the majority of Milwaukee County municipalities.

*Other Issues* to be considered that may be opportunities or threats to WINPHO based on a Strengths/Weaknesses/Opportunities/Threats (SWOT) Analysis:
- Confidentiality management (i.e., existing statutes and regulations on electronic data sharing and awareness of national trends).
- Decision by the Department of Health and Family Services to endorse a different strategy for data management and sharing.
- Lack of support by government or an emphasis on bureaucracy, which impedes rapid implementation of a system, could result in low participation by public health system partners, especially in the non-governmental sectors.
- It will be important that people who don't use the system routinely value WINPHO as a tool for others.
- Insufficient funding, staffing, system maintenance, and/or project assistance to users could impede the progress of implementation and reduce the likelihood of success.
- Can government take a leadership role in building and maintaining WINPHO, and also build the partnerships necessary for its success?
- Choosing what data sets to add to the system first will be crucial.

<u>Appendix D</u>. Assuring WINPHO Security and Privacy

Modern information technology ensures improved security and privacy. An integrated public health information system containing at least some individually identifiable health information raises issues of information security and privacy. Technology exists to address these issues. Connecting multiple systems starkly poses the question of how to match or link records regarding a single person or public health incident together. Authorizing access to health data on this scale is not a solved problem. To succeed, the WINPHO Management Team will have to address these issues very early on, *before* proposing a design for our public health infrastructure. WINPHO will provide for far better security than what we currently have.

<u>Security considerations.</u>
Computers connected to the general Internet can easily exchange information. It will be necessary to deploy completely new operating systems and applications which have been designed from the ground up with security in mind. It may also be necessary to segregate highly sensitive network traffic on private networks, as the Department of Defense does with their military network. It is important than any confidential health information stored on internet-accessible computer systems be carefully monitored for intrusion or inappropriate access. The Health Insurance Portability and Accountability Act (HIPAA) is establishing new security standards that will shore up security breaches in the private sector.

Throughout the development and deployment of WINPHO, a variety of security measures will be necessary. Careful design and testing of applications with security considerations in mind is one part of this. Public health will comply with and learn the Health Insurance Portability and Accountability Act standards even though it is not mandated. Examples of several of the security best practices which will need to be followed:
- Increased emphasis on security monitoring and training, possibly requiring additional staff.
- Timely action on changes in authorization and access rights. This includes regular password changes by all users, and prompt revocation of access when users leave the job.
- Use of security measures more stringent than simple passwords, such as certificates and physical tokens. Synchronized screens and systems are necessary.
- Extensive use of encryption technologies, both over the network and within applications, to protect sensitive data
- Extensive use of both host-based and network-based intrusion-monitoring tools. Examples include file integrity monitors such as Tripwire (http://www.tripwire.com/, and network monitors such as Network Flight Recorder (http://www.nfr.com/) or Snort (http://www.snort.org/).
- Testing applications against checklists of common security problems, such as buffer overflows, prior to deployment.
- Rapid deployment of security patches to operating systems, databases, and networks.
- Network security features such as firewalls and proxy servers.
- Application security features such as splitting functionality across multiple servers with the Internet accessible servers containing no databases and the database servers protected behind the network firewalls.

<u>Privacy considerations</u>
Privacy of individually identifiable health information is covered by a patchwork of state and federal laws and regulations, and has been a concern as long ago as the 1972 HEW Code of Fair Information Practices. A significant recent development is the Health Insurance Portability and Accountability Act

([http://www.hcfa.gov/hipaa/hipaahm.htm](http://www.hcfa.gov/hipaa/hipaahm.htm)). The Health Care Financing Association wrote privacy regulations to implement part of this act, which go into effect in 2003. Additional initiatives in this area include a Model State Public Health Privacy Act (see [http://www.critpath.org/msphpa/privacy.htm](http://www.critpath.org/msphpa/privacy.htm)) . A 1999 General Accounting Office Report found that current practices regarding health data were inadequate (GAO/HEHS-99-55 (Feb. 1999) Report to congressional requestors on Medical Record Privacy [http://www.epic.org/privacy/medical/gao-medical-privacy-399.pdf](http://www.epic.org/privacy/medical/gao-medical-privacy-399.pdf)).

Re-use of data originally collected for treatment purposes for secondary public health goals runs counter to the privacy goals, but is an explicit recognized and necessary function of health information. Past experience with census data further indicates that even when only aggregated data is available, partial identifying information, plus an ability to run multiple statistical queries, can infer individual characteristics with surprising accuracy. This prospect may become increasingly complex as more health data are geocoded.

Identification, Authentication, and Authorization.
Three of the key security challenges a networked system of computers must deal with are identification of users, authentication of the presence of a user at a computer, and authorization of a user to access and modify specific data.

The goal of *identification* is to distinguish between users. Common names shared by multiple individuals, such as "John Smith", is problematic. Similarly, identical computer login names in different administrative domains often also represent different individuals. A typical current solution is to use technology similar to Internet e-mail addresses, which solves the uniqueness problem, though the question of how to create and search a directory of such user identifiers across organizations remains.

The simplest and most widely used form of *authentication* is to challenge a purported user to provide a secret password. This is widely viewed in the security community as inadequate, particularly when used with older computer access protocols such as TELNET or FTP in which the passwords traverse the network as cleartext. None of the authentication mechanisms cited as acceptable examples in the Health Insurance Portability and Accountability Act security regulations uses simple passwords. There is considerable interest in using additional methods such as physical tokens, digital certificates, or biometrics to increase the reliability of authentication. The CDC has projects which are using SecureID tokens from RSA, Inc. ([http://www.rsa.com/products/securid/index.html](http://www.rsa.com/products/securid/index.html)). The American Medical Association is starting to use Public Key Infrastructure digital certificates from Verisign ([http://www.ama-assn.org/ama/pub/category/3133.html](http://www.ama-assn.org/ama/pub/category/3133.html)). 'Compare the way banks' regulate access to ATM stations dispensing cash based on a combination of information the user has (ATM card) and information the user knows (secret PIN code).

Likely implications for WINPHO include that: (1) authentication will have to be based on multiple factors, such as a password plus a digital certificate or physical token; (2) all communications, including the authentication dialog itself, will have to be encrypted; and (3) preferred authentication methods are likely to evolve 2-3 times in this decade[1], so it is required to support multiple methods simultaneously,

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[1] Microsoft operating systems alone have gone through 3 generations of authentication protocols in the last decade: LANMAN with windows 3.1 and windows 95, NTLM with windows NT 4, and Kerberos+LDAP with windows 2000. Similarly, Oracle databases support multiple authentication methods, one of which involves digital certificates.

and to have the flexibility to introduce new, future methods.[2.]

In spite of the popularity of Public Key Infrastructure adjuncts to authentication (PKI certificates are the basis for SSL encrypted communications with secure web sites), and promising ongoing efforts by the National Institute for Standards and Technology (http://csrc.nist.gov/pki/twg/welcome.html), Public Key Infrastructure is not a solved problem. There are no examples of Public Key Infrastructure deployed on the scale a public health information system would require, and a Public Key Infrastructure is not a security panacea. One thoughtful criticism of the current Public Key Infrastructure situation is "Ten Risks of Public Key Infrastructure:. . .," by C. Ellison and B. Schneier, Computer Security Journal, v 16, n 1, 2000, pp. 1-7. (Also at http://www.counterpane.com/pki-risks.html).[3]

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2 The security techniques used in IBM mainframe operating systems with facilities like RACF, and the Pluggable Authentication Modules (PAM) approach used in Sun Solaris (and picked up by Linux) are worth considering.  So are some approaches in the Microsoft .NET initiative.

3 The problem Microsoft had in January, 2001 with its Internet Explorer web browser honoring Public Key Infrastructure certificates erroneously issued and then revoked by Verisign illustrates risks #8 and #9.

Appendix E.  Summary of the Turning Point Subcommittee Requests to the Integrated Electronic Data Information Systems Subcommittee

| Priority Subcommittee | Examples of Data Needs |
|---|---|
| *Community Health Improvement Processes and Plans:* | Need baseline data and progress tracking. Need to support information sharing. |
| *Coordination of State and Local Public Health System Partnerships:* | Need baseline data and progress tracking. Need to support information sharing. |
| *Sufficient, Competent Workforce:* | Need to provide for enumeration of the public health workforce, including profession, race/ethnicity, and gaps and shortages. |
| *Equitable, Adequate, and Stable Financing:* | Need to allow for identification of gaps and disparities by essential services. Provide a strong infrastructure to support identification of emerging public health concern. Allow for analysis of governmental and non-governmental funding and other resources. |
| *Access to Primary and Preventive Health Services:* | Need data to track this priority, including elements of insurance coverage, employer demographics, coverage and co-pays, dental care, and barriers to care. |
| *Adequate and Appropriate Nutrition:* | Provide information on resources and services, linkages to related health concerns, surveillance and disparities, and allow for geo-coding and information sharing. |
| *Environmental and Occupational Health Hazards:* | Provide for food and water-borne disease tracking and outcomes. |
| *Existing, Emerging, and Re-emerging Communicable Diseases:* | Provide for data to support control, follow up, surveillance, rapid communication, vital records, hospital data, geographic information system (GIS) of disease events, and identification of disease clusters. |
| *High Risk Sexual Behavior:* | Need to collect baseline data and track progress. Need capacity for surveillance and evaluation. |
| *Alcohol and Other Substance Use and Addiction:* | Provide a directory of resources and allow for the collection of baseline data and progress tracking. Need capacity for surveillance and evaluation. |
| *Intentional and Unintentional Injuries and Violence:* | Need to collect baseline data and track progress. Need capacity for surveillance and evaluation. |
| *Mental Health and Mental Disorders:* | Provide baseline and tracking data. Include information on the availability of screening services across multiple settings, treatment services provided, and enumeration of and scope of public health. Allow for information sharing. |
| *Overweight, Obesity, and Lack of Physical Activity:* | Need to collect baseline data and track progress. Need capacity for surveillance and evaluation. |
| *Social and Economic Factors that Influence Health:* | Need to collect baseline data and track progress. Need capacity for surveillance and evaluation. Need to develop social indicators for population health. |
| *Tobacco Use and Exposure:* | Need to collect baseline data and track progress. Need capacity for surveillance and evaluation. |